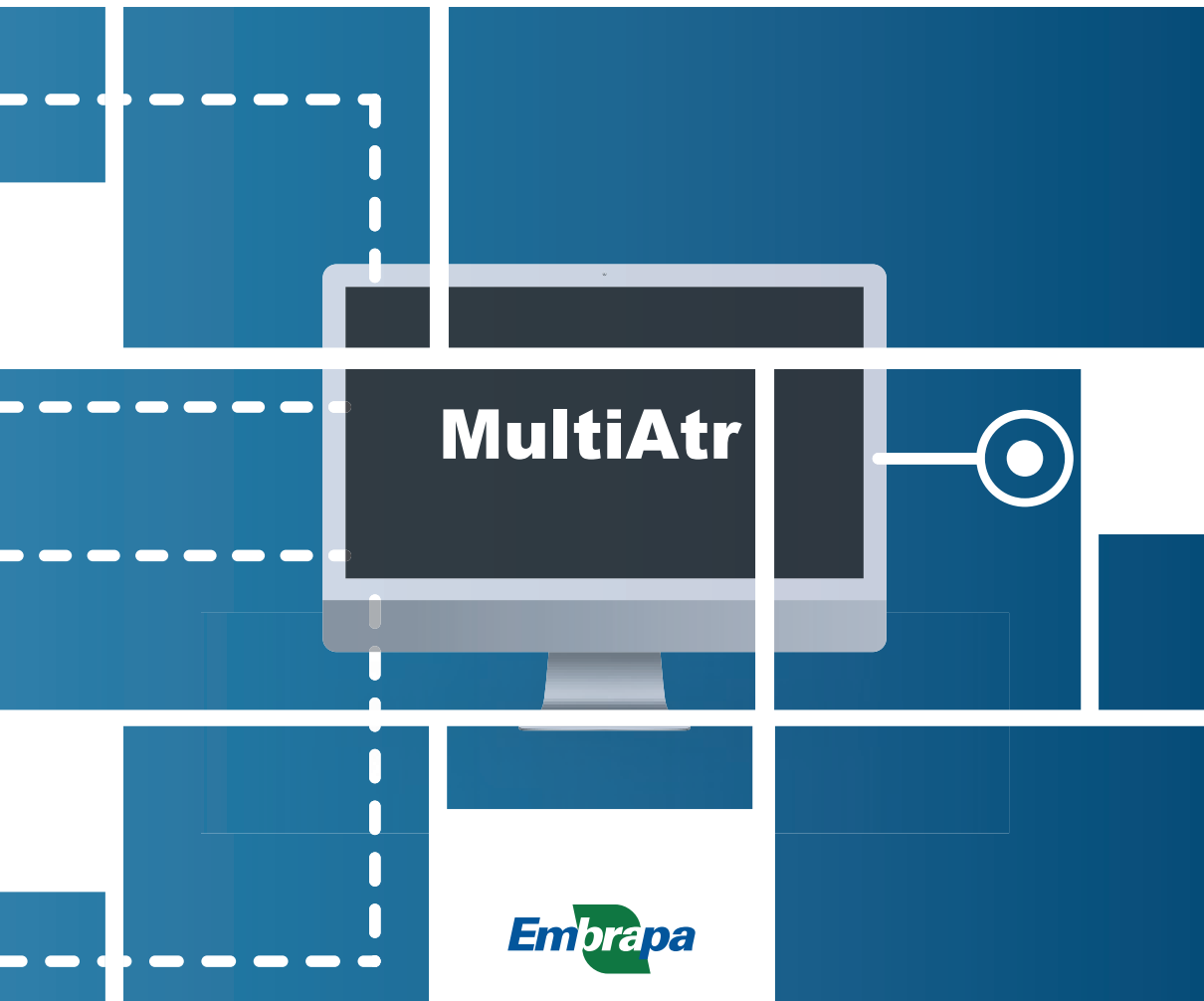
DOCUMENTOS
143

ISSN 1676-7659
November / 2021

Multiatr: a tool for ranking of pairwise alternatives



Embrapa

ISSN 1676-7659
November / 2021

Brazilian Agricultural Research Corporation
Embrapa Goats & Sheep
Ministry of Agriculture, Livestock and Food Supply

DOCUMENTOS 143

Multiatr: a tool for ranking of pairwise alternatives

Raimundo Nonato Braga Lôbo

Embrapa Goats & Sheep
Sobral, CE
2021

This publication is avaiable at:

Embrapa Goats & Sheep
Fazenda Três Lagoas, Estrada Sobral/
Groaíras, Km 4 Caixa Postal: 71
CEP: 62010-970 - Sobral,CE
Fone: (88) 3112-7400
www.embrapa.br
www.embrapa.br/fale-conosco/sac

Editorial supervision
Alexandre César Silva Marinho

Bibliographic standardization
Tânia Maria Chaves Campêlo

Collection graphic design
Carlos Eduardo Felice Barbeiro

Desktop publishing
Maíra Vergne Dias

Cover art
Maíra Vergne Dias

1st edition
Digital publication (2021)

Cataloging-in-Publication (CIP) Data

Embrapa Goats & Sheep

Lôbo, Raimundo Nonato Braga.
Multiatr: a tool for ranking of pairwise alternatives / Raimundo Nonato Braga Lôbo - Sobral : Embrapa Goats & Sheep, 2021.
PDF (24 p) : il. color. -- (Documentos / Embrapa Goats & Sheep, ISSN 1676-7659; 143).

1. Decision support systems. 2. Animal breeding. 3. Breeding programs. 4. Genetic improvement. 5. Computer software. I. Título. II. Série. III. Embrapa Goats & Sheep.

CDD 004.678 (21. ed.)

Tânia Maria Chaves Campêlo (CRB-3 620)

Author

Raimundo Nonato Braga Lôbo
Veterinarian, Doctor of Animal Sciences, researcher at Embrapa Goats & Sheep, Sobral, CE, Brazil.

Presentation

The decision-making process is complex and often demands time and difficulties for managers, project coordinators and, especially here, specialists in genetic improvement programs. Tools that can help this process are always welcome and are added to other alternatives for a correct and efficient decision.

Despite the possibility of being used in several areas of knowledge, the MultiAtr software was specially developed for the definition of weights for the selection objectives of animal breeding programs. Its use in interviews with specialists, breeders and scholars can contribute to the direction of these programs by the scientists involved in this decision.

Based on this, it is recommended, for the scientific community and other decision-making actors, this “Série Embrapa – Documentos” as a practical guide for the correct use of the software, exploring its possibilities to the full.

Marco Aurélio Delmondes Bomfim
Head of Embrapa Goats & Sheep

Table of Contents

Introduction

‘Point’, ‘point-count’, ‘score’ and ‘linear’ systems are known as additive multi-attribute value models with performance categories. They are solutions to generalized problems of how to combine alternative features on multiple criteria to rank the alternatives. Hansen and Ombler (2009) presented a method for ‘scoring’ such models to determine their values, based on decision makers’ preferences. This method is called by the acronym PAPRIKA (Potentially All Pairwise RanKings of all possible Alternatives), and involves the decision maker’s peer ranking. Potentially, all undominated pairs of all possible alternatives represented by the value model are scored. An ‘undominated pair’ is a pair of alternatives where one is characterized by a higher-ranking category for at least one criterion and a lower ranking for at least one other criterion of another alternative. On the other hand, alternatives in a “dominated pair” are inherently paired because one has a higher rank for at least one criterion and no lower rank for the other criterion.

This method proved to be more efficient than traditional methods that include conjoint analysis (Green; Srinivasan, 1978, 1990), direct rating (Winterfeldt; Edwards, 1986), MART (Edwards, 1977; Edwards; Barron, 1994), SMARTER (Edwards; Barron, 1994), SWING (Winterfeldt; Edwards, 1986), and the Analytical Hierarchy Process (Saaty, 1980, 1990). There are several applications of this type of model, to classify specific alternatives known by decision makers, such as prioritizing patients for access to health care, classifying students who apply to higher education schools, selecting immigrants by immigration services, etc. In animal improvement, it is applicable to define the importance and weights of selection objectives in participatory improvement programs, based on the alternatives prioritized by the interviewed participants.

The MultiAtr software was developed in FORTRAN language for use in command prompt (CMD). From the inequalities (strict preference) and equalities (indifference) corresponding to the explicitly classified pairs, the point values are obtained in MultiAtr through linear programming with the simplex method. Although several solutions are possible for the linear program of inequalities and equalities, all the resulting point values reproduce the same general classification of alternatives. The aim of this manuscript is present how to use MultiAtr.

Installing and using multiatr

MultiAtr was compiled for Windows© (32 and 64 bits). After getting the executable file, it can be placed in any directory preferred by the user. No need for any additional installation.

Open the prompt of command (CMD; in Windows© search field type cmd) and goes to the directory where the software is. As an example, if the software is in the C:\MultiAtr directory, type at the command prompt 'cd C:\MultiAtr' and hit the enter key.

Thus, type MultiAtr and hit enter key starting the software. The sequence that follows indicates the questions that the MultiAtr will ask to develop the assessment.

IS IT A NEW SURVEY OR CONTINUED FROM A PREVIOUS?

1 = NEW 2 = CONTINUED (1)

The software can carry out a simple decision or a poll. In the case of surveys, respondents are usually consulted at different times, so that it is possible to continue the interviews at other times. Thus, if a survey is being carried out with several interviewees and it was stopped previously, you can type 2 and continue where you left off (Figure 1).

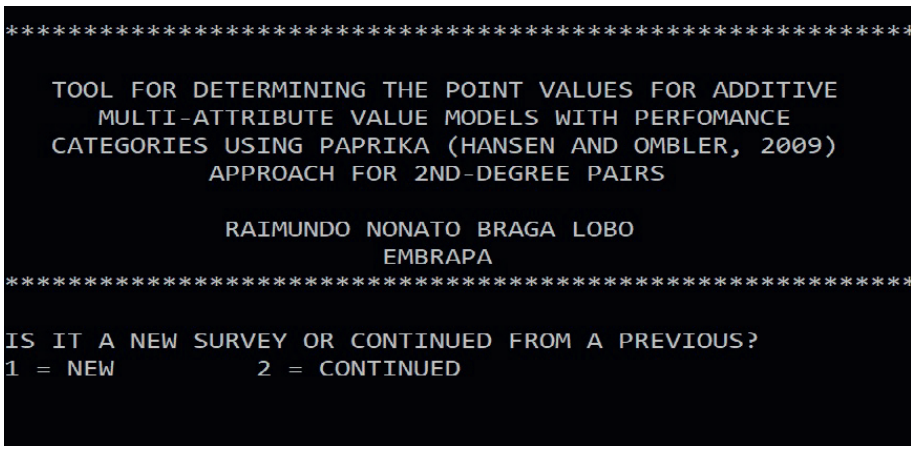


Figure 1. Image of command prompt starting an analysis with MultiAtr.

If it is a new evaluation, the sequence follows.

TYPE A NAME (<=25 CHARS.) FOR YOUR JOB (2)

Give a name for your evaluation and remember the same if it were to continue it. This name must be up to 25 characters long. Avoid using special characters and blanks.

HOW MANY INTERVIEWED WAS SURVEYED? (3)

Enter the number of respondents. If it is one, a decision will be made, if more than one, a survey will be carried out.

HOW MANY CRITERIA USED IN THIS APPROACH? (4)

Enter the number of criteria that will be evaluated. A maximum of 20 per assessment is allowed.

HOW MANY CATEGORIES BY CRITERIA? (5)

Enter the category number for each criterion that will be evaluated. A maximum of 5 per criterion is allowed.

INFORM NAME (<=25 CHARS.) FOR CRITERIA # (6)

NOW INFORM IN DECRESCENT ORDER OF IMPORTANCE (FROM HIGHEST LEVEL TO LOWEST LEVEL) EACH CATEGORY (TYPE ENTER AFTER EACH ONE) FOR CRITERIA # (7)

Sequences 6 and 7 will be repeated according to the number of criteria indicated. In 6, enter the name of each criterion up to 25 characters long. At 7, enter the category names in each line, up to the maximum indicated in the analysis, starting with the highest ranking. After each one, click the enter key to go to the next line (Figure 2).

```
HOW MANY CRITERIA USED IN THIS APPROACH?
3
HOW MANY CATEGORIES BY CRITERIA?
2
INFORM NAME (<=25 CHARS.) FOR CRITERIA           1
FERTILITY
NOW INFORM IN DECRESCENT ORDER OF IMPORTANCY (FROM
HIGHEST LEVEL TO LOWEST LEVEL) EACH CATEGORY (TYPE
ENTER AFTER EACH ONE) FOR CRITERIA           1
MORE 10%
EQUAL IS ALREADY
INFORM NAME (<=25 CHARS.) FOR CRITERIA           2
MORTALITY
NOW INFORM IN DECRESCENT ORDER OF IMPORTANCY (FROM
HIGHEST LEVEL TO LOWEST LEVEL) EACH CATEGORY (TYPE
ENTER AFTER EACH ONE) FOR CRITERIA           2
LESS 10%
EQUAL IS ALREADY
INFORM NAME (<=25 CHARS.) FOR CRITERIA           3
ADULT WEIGHT
NOW INFORM IN DECRESCENT ORDER OF IMPORTANCY (FROM
HIGHEST LEVEL TO LOWEST LEVEL) EACH CATEGORY (TYPE
ENTER AFTER EACH ONE) FOR CRITERIA           3
LESS 10KG
EQUAL IS ALREADY
```

Figure 2. Inputting information for an analysis with 3 criteria and 2 categories per criterion in MultiAtr.

TYPE THE NAME OF THE INTERVIEWED (8)

Enter the respondent's name, up to 25 characters.

DO YOU WANT CHOOSE THE QUESTION? IF YES TYPE THE NUMBER LOWER THEN # OR ZERO TO CONTINUE (10)

At this point, the user can choose a specific question, typing its number (value between 1 and what will be presented in place of the #) or typing 0 for the system to choose at random.

Then, the question chooses by user or randomly presented by the software will be presented on screen with the combination between two criteria and two of their categories, in an inverse way in their levels. According to the example below.

****

WHAT IS YOUR PREFERENCE REGARDING THIS CHOICE?

FERTILITY MORE 10% AND ADULT WEIGHT EQUAL IS ALREADY

OR

FERTILITY EQUAL IS ALREADY AND ADULT WEIGHT LESS 10KG

TYPE 1 TO OPTION 1, 2 TO OPTION 2, 3 THEY ARE EQUAL, 4 TO SKIP AND 5 TO STOP

****

If the respondent prefers the superior option, enter 1, if he/she prefers the inferior, enter 2, or, if he/she thinks that the alternatives are similar, enter 3. If he/she don't want to answer the alternative at that moment, you can type 4 to skip it. To end the interview, type 5 and MultiAtr will make the assessment using the data answered so far.

The maximum number of alternatives is defined by the number of categories raised to the number of criteria (NCATEGNCRIT). However, as the alternatives are arranged at different levels between the categories, according to the number of criteria and categories, the number of questions may not reach this maximum. Furthermore, according to the respondent's answers, some alternatives are being eliminated as they are contradictory.

If, in sequence 3, only one was typed, indicating a decision, after the respondent answers their preferences, MultiAtr estimates the ranking and weight of each criterion. If the number of respondents is greater than one, indicating a survey, a question is asked:

WANT TO DO A NEW INTERVIEW OR STOP AND CONTINUE LATER? (11)

1 = YES 2 = CONTINUE LATER

Here, answer yes (type 1) if you want to continue with another respondent, or no (type 2) if you want to continue at another time. In case of continuing a new set of preference questions will be generated for the next respondent. Sequences 8, 9 and 10 are repeated until the end with the new interviewee and again this question (11) will appear, if there are still interviews to be done. When all interviews are completed, MultiAtr will present the final result. If you want to continue later, the software will be closed.

To restart a previous analysis, start MultiAtr again and type 2 in sequence 1. The following question will appear:

TYPE THE NAME OF THE FILE WITH THE INFORMATION TO CONTINUE THE JOB

ATTENTION!! THE NAME MUST BE TYPED EXACTLY AS IT WAS DONE WHEN THE PRIOR ANALYSIS BEGAN, WITH THE .CONT EXTENSION (12)

IT IS NOT NECESSARY TO ENTER THE .CONT EXTENSION

Enter the same name given in the previous job that will be continued. If you do not use this name correctly, the analysis may be lost. At this point, the software advances to sequence 8, so that the name of the respondent is informed.

Thus, repeating sequences 8, 9, 10 and 11, until the analysis is completed or continued, according to the number of interviewees previously determined.

The final result is presented in a text file (.TXT) with the name of the evaluation given in sequence 2.

Final considerations

The MultiAtr proved to be very useful for selection in additive models with multi-attributes of performance. It is an easy to use and general application software. The results are presented in a simple, easy-to-use text file. It can facilitate difficult decision-making, often inaccessible in complex systems with little available information, such as in rural communities, especially for situations with unavailability of financial resources, such as the conditions of participatory Community Based Breeding Programs (CBBPs).

References

EDWARDS, W.; BARRON, F. H. SMARTS and SMARTER: improved simple methods for multiattribute utility measurement. **Organizational Behavior and Human Decision Processes**, v. 60, n. 3, p. 306-325, Dec. 1994. DOI: https://doi.org/10.1006/obhd.1994.1087

EDWARDS, W. How to use multiattribute utility measurement for social decision making. **IEEE Transactions on Systems, Man and Cybernetics**, v. 7, n. 5, p. 326-340, May, 1977. DOI: 10.1109/TSMC.1977.4309720

GREEN, P. E.; SRINIVASAN, V. Conjoint analysis in consumer research: issues and outlook. **Journal of Consumer Research**, v. 5, n. 2, p. 103-123, Sept. 1978. DOI: https://doi.org/10.1086/208721

GREEN, P. E.; SRINIVASAN, V. Conjoint analysis in marketing: new developments with implications for research and practice. **Journal of Marketing**, v. 54, n. 4, p. 3-19, 1990. DOI: https://doi.org/10.2307/1251756

HANSEN, P.; OMBLER, F. A New method for scoring additive multi-attribute value models using pairwise rankings of alternatives. **Journal of Multi-Criteria Decision Analysis**, v. 15, n. 3/4, p. 87-107, May/Aug. 2009. DOI: https://doi.org/10.1002/mcda.428

SAATY, T. L. How to make a decision: the analytic hierarchic process. **European Journal of Operational Research**, v. 48, n. 1, p. 9-26, Sept. 1990. DOI: https://doi.org/10.1016/0377-2217(90)90057-I

SAATY, T. L. **The analytic hierarchic process**. New York: McGraw Hill, 1980. 287 p.

WINTERFELDT, D. von; EDWARDS, W. **Decision analysis and behavioral research**. New York: Cambridge University Press, 1986.

Appendix

Example of a decision made with three criteria and two categories per criterion.

```
**********************************************************************************************************
                TOOL FOR DETERMINING THE POINT VALUES FOR ADDITIVE
                MULTI-ATTRIBUTE VALUE MODELS WITH PERFOMANCE
                CATEGORIES USING PAPRIKA (Hansen; Ombler, 2009)
                APPROACH FOR 2ND-DEGREE PAIRS

                RAIMUNDO NONATO BRAGA LOBO
                EMBRAPA
**********************************************************************************************************
IS IT A NEW SURVEY OR CONTINUED FROM A PREVIOUS?
1 = NEW          2 = CONTINUED
1
TYPE A NAME (<=25 CHARS.) FOR YOUR JOB
TEST
HOW MANY INTERVIEWED WAS SURVEYED?
1
HOW MANY CRITERIA USED IN THIS APPROACH?
3
HOW MANY CATEGORIES BY CRITERIA?
2
INFORM NAME (<=25 CHARS.) FOR CRITERIA                                  1
FERTILITY
NOW INFORM IN DECRESCENT ORDER OF IMPORTANCE (FROM
HIGHEST LEVEL TO LOWEST LEVEL) EACH CATEGORY (TYPE
ENTER AFTER EACH ONE) FOR CRITERIA                                      1
MORE 10%
EQUAL
INFORM NAME (<=25 CHARS.) FOR CRITERIA                                  2
MORTALITY
NOW INFORM IN DECRESCENT ORDER OF IMPORTANCE (FROM
HIGHEST LEVEL TO LOWEST LEVEL) EACH CATEGORY (TYPE
```

```
ENTER AFTER EACH ONE) FOR CRITERIA                                    2
LESS 10%
EQUAL
INFORM NAME (<=25 CHARS.) FOR CRITERIA                                3
ADULT WEIGHT
NOW INFORM IN DECRESCENT ORDER OF IMPORTANCE (FROM
HIGHEST LEVEL TO LOWEST LEVEL) EACH CATEGORY (TYPE
ENTER AFTER EACH ONE) FOR CRITERIA                                    3
LESS 5KG
EQUAL
INTERVIEWED                                                           1
REMAINING INTERVIEWEES                                                0
TYPE THE NAME OF THE INTERVIEWED
JOHN
DO YOU WANT CHOOSE THE QUESTION? IF YES TYPE THE NUMBER LOWER THEN    3
OR ZERO TO CONTINUE
0
*********************************************************************************************************
WHAT IS YOUR PREFERENCE REGARDING THIS CHOICE?
FERTILITY          MORE 10%          AND ADULT WEIGHT        EQUAL
                OR
FERTILITY          EQUAL             AND ADULT WEIGHT        LESS 5KG
TYPE 1 TO OPTION 1, 2 TO OPTION 2, 3 THEY ARE EQUAL, 4 TO SKIP AND 5 TO STOP
*********************************************************************************************************
1
RESPONSE =  33.33%
DO YOU WANT CHOOSE THE QUESTION? IF YES TYPE THE NUMBER LOWER THEN    3
OR ZERO TO CONTINUE
0
*********************************************************************************************************
WHAT IS YOUR PREFERENCE REGARDING THIS CHOICE?
FERTILITY          MORE 10%          AND MORTALITY           EQUAL
                OR
FERTILITY          EQUAL             AND MORTALITY           LESS 10%
TYPE 1 TO OPTION 1, 2 TO OPTION 2, 3 THEY ARE EQUAL, 4 TO SKIP AND 5 TO STOP
*********************************************************************************************************
3
RESPONSE = 100.00%
```

CRITERIA FERTILITY	CATEGORY MORE 10%	=	0.400000
CRITERIA FERTILITY	CATEGORY EQUAL	=	0.000000
CRITERIA MORTALITY	CATEGORY LESS 10%	=	0.400000
CRITERIA MORTALITY	CATEGORY EQUAL	=	0.000000
CRITERIA ADULT WEIGHT	CATEGORY LESS 5KG	=	0.200000
CRITERIA ADULT WEIGHT	CATEGORY EQUAL	=	0.000000

FERTILITY CRITERION WEIGHT	(SUM=1)	SCORE (0-100)		PREFERENCE VALUE
EQUAL	0.400	x 0.0	=	0.0%
MORE 10%		x 100.0	=	40.0%
MORTALITY				
EQUAL	0.400	x 0.0	=	0.0%
LESS 10%		x 100.0	=	40.0%
ADULT WEIGHT				
EQUAL	0.200	x 0.0	=	0.0%
LESS 5KG		x 100.0	=	20.0%

The TEST.TXT file generated in this analysis presents the following results:

```
**********************************************************************************************************

        TOOL FOR DETERMINING THE POINT VALUES FOR ADDITIVE
        MULTI-ATTRIBUTE VALUE MODELS WITH PERFOMANCE
        CATEGORIES USING PAPRIKA (Hansen; Ombler, 2009)
        APPROACH FOR 2ND-DEGREE PAIRS

                RAIMUNDO NONATO BRAGA LOBO
                EMBRAPA
**********************************************************************************************************

DECISION =      TEST

----------------------------------------------------------------------------------------------------------

                TOTAL OF INTERVIEWED =          1

----------------------------------------------------------------------------------------------------------


----------------------------------------------------------------------------------------------------------

                INFORMED CRITERIA / CATEGORIES

----------------------------------------------------------------------------------------------------------
```

FERTILITY
CATEGORY 2 = MORE 10%
CATEGORY 1 = EQUAL
MORTALITY
CATEGORY 2 = LESS 10%
CATEGORY 1 = EQUAL
ADULT WEIGHT
CATEGORY 2 = LESS 5KG
CATEGORY 1 = EQUAL

TOTAL OF POSSIBLE ALTERNATIVES = 8

NAMES OF THE INTERVIEWED
1 INTERVIEWED NAME = JOHN

NUMBER OF TRADE-OFF MADE BY INTERVIEWED

INTERVIEWED 1 TRADE-OFF MADE = 2

PREFERENCE VALUES

FERTILITY CRITERION WEIGHT	(SUM=1)		SCORE (0-100)		PREFERENCE VALUE
EQUAL	0.400	x	0.0	=	0.0%
MORE 10%		x	100.0	=	40.0%
MORTALITY					
EQUAL	0.400	x	0.0	=	0.0%
LESS 10%		x	100.0	=	40.0%
ADULT WEIGHT					
EQUAL	0.200	x	0.0	=	0.0%
LESS 5KG		x	100.0	=	20.0%

RELATIVE IMPORTANCE OF CRITERIA

		FERTILITY 40.0 %	MORTALITY 40.0 %	ADULT WEIGHT 20.0 %
FERTILITY	40.0 %	1.0	1.0	2.0
MORTALITY	40.0 %	1.0	1.0	2.0
ADULT WEIGHT	20.0 %	0.5	0.5	1.0

Example of a survey with two interviewed made with three criteria and two categories per criterion.

```
**************************************************************************************************

                TOOL FOR DETERMINING THE POINT VALUES FOR ADDITIVE
                MULTI-ATTRIBUTE VALUE MODELS WITH PERFOMANCE
                CATEGORIES USING PAPRIKA (Hansen; Ombler, 2009)
                APPROACH FOR 2ND-DEGREE PAIRS

                        RAIMUNDO NONATO BRAGA LOBO
                                EMBRAPA
**************************************************************************************************

IS IT A NEW SURVEY OR CONTINUED FROM A PREVIOUS?
1 = NEW             2 = CONTINUED
1
TYPE A NAME (<=25 CHARS.) FOR YOUR JOB
TEST
HOW MANY INTERVIEWED WAS SURVEYED?
2
HOW MANY CRITERIA USED IN THIS APPROACH?
3
HOW MANY CATEGORIES BY CRITERIA?
2
INFORM NAME (<=25 CHARS.) FOR CRITERIA                          1
FERTILITY
NOW INFORM IN DECRESCENT ORDER OF IMPORTANCE (FROM
HIGHEST LEVEL TO LOWEST LEVEL) EACH CATEGORY (TYPE
ENTER AFTER EACH ONE) FOR CRITERIA                              1
MORE 10%
EQUAL
INFORM NAME (<=25 CHARS.) FOR CRITERIA                          2
MORTALITY
NOW INFORM IN DECRESCENT ORDER OF IMPORTANCE (FROM
HIGHEST LEVEL TO LOWEST LEVEL) EACH CATEGORY (TYPE
ENTER AFTER EACH ONE) FOR CRITERIA                              2
LESS 10%
EQUAL
INFORM NAME (<=25 CHARS.) FOR CRITERIA                          3
ADULT WEIGHT
NOW INFORM IN DECRESCENT ORDER OF IMPORTANCE (FROM
```

HIGHEST LEVEL TO LOWEST LEVEL) EACH CATEGORY (TYPE
ENTER AFTER EACH ONE) FOR CRITERIA 3
LESS 10KG
EQUAL
INTERVIEWED 1
REMAINING INTERVIEWEES 1
TYPE THE NAME OF THE INTERVIEWED
PAUL
DO YOU WANT CHOOSE THE QUESTION? IF YES TYPE THE NUMBER LOWER THEN 3
OR ZERO TO CONTINUE
0
****
WHAT IS YOUR PREFERENCE REGARDING THIS CHOICE?
MORTALITY LESS 10% AND ADULT WEIGHT EQUAL
OR
MORTALITY EQUAL AND ADULT WEIGHT LES 10KG
TYPE 1 TO OPTION 1, 2 TO OPTION 2, 3 THEY ARE EQUAL, 4 TO SKIP AND 5 TO STOP
****
1
RESPONSE = 33.33%
DO YOU WANT CHOOSE THE QUESTION? IF YES TYPE THE NUMBER LOWER THEN 3
OR ZERO TO CONTINUE
0
****
WHAT IS YOUR PREFERENCE REGARDING THIS CHOICE?
FERTILITY MORE 10% AND MORTALITY EQUAL
OR
FERTILITY EQUAL AND MORTALITY LESS 10%
TYPE 1 TO OPTION 1, 2 TO OPTION 2, 3 THEY ARE EQUAL, 4 TO SKIP AND 5 TO STOP
****
2
RESPONSE = 66.67%
DO YOU WANT CHOOSE THE QUESTION? IF YES TYPE THE NUMBER LOWER THEN 3
OR ZERO TO CONTINUE
0
****
WHAT IS YOUR PREFERENCE REGARDING THIS CHOICE?
FERTILITY MORE 10% AND ADULT WEIGHT EQUAL
OR
FERTILITY EQUAL AND ADULT WEIGHT LES 10KG
TYPE 1 TO OPTION 1, 2 TO OPTION 2, 3 THEY ARE EQUAL, 4 TO SKIP AND 5 TO STOP
****

```
1
RESPONSE = 100.00%

CRITERIA FERTILITY              CATEGORY MORE 10%     =     0.333333
CRITERIA FERTILITY              CATEGORY EQUAL        =     0.000000
CRITERIA MORTALITY              CATEGORY LESS 10%     =     0.500000
CRITERIA MORTALITY              CATEGORY EQUAL        =     0.000000
CRITERIA ADULT WEIGHT           CATEGORY LES 10KG     =     0.166667
CRITERIA ADULT WEIGHT           CATEGORY EQUAL        =     0.000000

WANT TO DO A NEW INTERVIEW OR STOP AND CONTINUE LATER?
1 = YES          2 = CONTINUE LATER
1
INTERVIEWED                              2
REMAINING INTERVIEWEES                   0
TYPE THE NAME OF THE INTERVIEWED
JOHN
DO YOU WANT CHOOSE THE QUESTION? IF YES TYPE THE NUMBER LOWER THEN     3
OR ZERO TO CONTINUE
0
**************************************************************************
WHAT IS YOUR PREFERENCE REGARDING THIS CHOICE?
MORTALITY          LESS 10%          AND ADULT WEIGHT       EQUAL
                OR
MORTALITY          EQUAL             AND ADULT WEIGHT       LES 10KG
TYPE 1 TO OPTION 1, 2 TO OPTION 2, 3 THEY ARE EQUAL, 4 TO SKIP AND 5 TO STOP
**************************************************************************
2
RESPONSE =  33.33%
DO YOU WANT CHOOSE THE QUESTION? IF YES TYPE THE NUMBER LOWER THEN     3
OR ZERO TO CONTINUE
0
**************************************************************************
WHAT IS YOUR PREFERENCE REGARDING THIS CHOICE?
FERTILITY          MORE 10%          AND MORTALITY          EQUAL
                OR
FERTILITY          EQUAL             AND MORTALITY          LESS 10%
TYPE 1 TO OPTION 1, 2 TO OPTION 2, 3 THEY ARE EQUAL, 4 TO SKIP AND 5 TO STOP
**************************************************************************
1
RESPONSE =  66.67%
```

DO YOU WANT CHOOSE THE QUESTION? IF YES TYPE THE NUMBER LOWER THEN 3 OR ZERO TO CONTINUE

0

****

WHAT IS YOUR PREFERENCE REGARDING THIS CHOICE?

MORTALITY LESS 10% AND ADULT WEIGHT EQUAL

OR

MORTALITY EQUAL AND ADULT WEIGHT LES 10KG

TYPE 1 TO OPTION 1, 2 TO OPTION 2, 3 THEY ARE EQUAL, 4 TO SKIP AND 5 TO STOP

****

2

RESPONSE = 66.67%

CRITERIA FERTILITY	CATEGORY MORE 10%	=	0.400000
CRITERIA FERTILITY	CATEGORY EQUAL	=	0.000000
CRITERIA MORTALITY	CATEGORY LESS 10%	=	0.200000
CRITERIA MORTALITY	CATEGORY EQUAL	=	0.000000
CRITERIA ADULT WEIGHT	CATEGORY LES 10KG	=	0.400000
CRITERIA ADULT WEIGHT	CATEGORY EQUAL	=	0.000000

	SUMMARY STATISTICS (N= 2)		INTERVIEWED	
	MEAN	SD	1	2
FERTILITY				
EQUAL	0.0	0.0	0.0	0.0
MORE 10%	36.7	3.3	33.3	40.0
MORTALITY				
EQUAL	0.0	0.0	0.0	0.0
LESS 10%	35.0	15.0	50.0	20.0
ADULT WEIGHT				
EQUAL	0.0	0.0	0.0	0.0
LES 10KG	28.4	11.6	16.7	40.0

The TEST.TXT file generated in this analysis presents the following results:

****

TOOL FOR DETERMINING THE POINT VALUES FOR ADDITIVE
MULTI-ATTRIBUTE VALUE MODELS WITH PERFOMANCE
CATEGORIES USING PAPRIKA (Hansen; Ombler, 2009)
APPROACH FOR 2ND-DEGREE PAIRS

RAIMUNDO NONATO BRAGA LOBO
EMBRAPA

****

SURVEY = TEST

TOTAL OF INTERVIEWED = 2

INFORMED CRITERIA / CATEGORIES

FERTILITY
CATEGORY 2 = MORE 10%
CATEGORY 1 = EQUAL
MORTALITY
CATEGORY 2 = LESS 10%
CATEGORY 1 = EQUAL
ADULT WEIGHT
CATEGORY 2 = LES 10KG
CATEGORY 1 = EQUAL

TOTAL OF POSSIBLE ALTERNATIVES = 8

NAMES OF THE INTERVIEWED
1 INTERVIEWED NAME = PAUL
2 INTERVIEWED NAME = JOHN

NUMBER OF TRADE-OFF MADE BY INTERVIEWED
INTERVIEWED 1 TRADE-OFF MADE = 3
INTERVIEWED 2 TRADE-OFF MADE = 3

PREFERENCE VALUES

	SUMMARY STATISTICS (N= 2)		INTERVIEWED	
	MEAN %	SD %	1	2
FERTILITY				
EQUAL	0.0	0.0	0.0	0.0

MORE 10%	36.7	3.3	33.3	40.0
MORTALITY				
EQUAL	0.0	0.0	0.0	0.0
LESS 10%	35.0	15.0	50.0	20.0
ADULT WEIGHT				
EQUAL	0.0	0.0	0.0	0.0
LES 10KG	28.4	11.6	16.7	40.0

RELATIVE IMPORTANCE OF CRITERIA

		FERTILITY	MORTALITY	ADULT WEIGHT
		36.7 %	35.0 %	28.4 %
FERTILITY	36.7 %	1.0	1.0	1.3
MORTALITY	35.0 %	1.0	1.0	1.2
ADULT WEIGHT	28.4 %	0.8	0.8	1.0

CRITERIA RANKINGS

	SUMMARY (N= 2)	INTERVIEWED	
	MEAN	1	2
FERTILITY	1.750	2	1
MORTALITY	2.000	1	3
ADULT WEIGHT	2.250	3	1

Embrapa

Goats & Sheeps

MINISTRY OF
AGRICULTURE, LIVESTOCK
AND FOOD SUPPLY

PÁTRIA AMADA
BRASIL
BRAZILIAN GOVERNMENT